

IN THE UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF WISCONSIN

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SSI TECHNOLOGIES, LLC,

Plaintiff,

v.

OPINION and ORDER

DONGGUAN ZHENGYANG ELECTRONIC  
MECHANICAL LTD,

20-cv-19-jdp

Defendant.

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Plaintiff SSI Technologies, LLC has prevailed in a patent infringement suit against defendant Dongguan Zhengyang Electronic Mechanical LTD (DZEM). The background to the technology and the full procedural history of the case are in two of the court's previous summary judgment orders. Dkt. 199; Dkt. 239. The background that matters most for this order is that the court ruled on summary judgment that DZEM infringed the '038 patent and damages and willfulness were tried to a jury. The jury found DZEM's infringement to be willful during two periods and awarded damages of approximately \$16.6 million. Post-trial motions are now before the court.

ANALYSIS

**A. DZEM's motion for judgment as a matter of law or for new trial**

DZEM moves for judgment as a matter of law on three bases: (1) the jury's finding of willfulness is not supported by evidence; (2) there was no evidence to support the jury's inclusion of sales to PACCAR among infringing sales; and (3) there was no evidence to support the jury's award of lost profits. Alternatively, DZEM moves for a new trial based on several of the court's evidentiary rulings.

On a motion for judgment as a matter of law under Rule 50(b), the question is whether the evidence, and reasonable inferences drawn from it, supports the verdict. *EEOC v. AutoZone, Inc.*, 707 F.3d 824, 835 (7th Cir. 2013). The court views the evidence in the light most favorable to the prevailing party, here SSI. *Passananti v. Cook County*, 689 F.3d 655, 659 (7th Cir. 2012). The court may not reweigh the evidence or make credibility determinations, and it does not consider evidence favorable to the moving party that the jury was not required to believe. *Id.* The court may grant DZEM's motion only if no rational jury could have found for SSI. *Id.*

The court may grant a motion for a new trial under Rule 59(a) if the verdict is “against the manifest weight of the evidence or if the trial was in some way unfair to the moving party.” *Lewis v. McLean*, 941 F.3d 886, 891 (7th Cir. 2019). A verdict is contrary to the manifest weight of the evidence only if no rational jury could have rendered the verdict. *Willis v. Lepine*, 687 F.3d 826, 836 (7th Cir. 2012). The court should order a new trial only if the record shows the jury's verdict “resulted in a miscarriage of justice or where the verdict, on the record, cries out to be overturned or shocks [the] conscience.” *Davis v. Wis. Dep't of Corr.*, 445 F.3d 971, 979 (7th Cir. 2006) (citation omitted). As under Rule 50, the court does not make credibility determinations or weigh the evidence. *Whitehead v. Bond*, 680 F.3d 919, 925 (7th Cir. 2012).

### **1. Willfulness**

The willfulness inquiry is framed by two decisions of this court. This court held on September 3, 2021, that DZEM did not infringe the '038 patent. Dkt. 199. The Federal Circuit reversed that decision and remanded the case. The court then decided on May 23, 2024, based primarily on the Federal Circuit's interpretation of the term “filter,” that DZEM did infringe the '038 patent. Dkt. 239. The jury found that DZEM's infringement was willful both before

and after the two decisions by this court. Accordingly, the jury found DZEM's infringement to be willful during two periods: from January 2019 to September 3, 2021, and from May 23, 2024 to the date of the trial.

**a. Willfulness from January 2019 to September 3, 2021**

DZEM's core argument is that during this first period, it had a reasonable, good-faith belief that it did not infringe the '038 patent based on its claim construction of the term "filter." The reasonableness of that position, so the argument goes, is confirmed by this court's adoption of that interpretation in the first summary judgment decision. DZEM cites trial testimony from Snow Mei and Ernie Huang to support DZEM's good-faith belief.

There are several problems with DZEM's argument.

First, the court's first summary judgment opinion says nothing about the state of mind of DZEM's personnel during the relevant period. Willfulness is judged by the state of mind of the infringer at the time of the infringement. *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 579 U.S. 93, 105 (2016). The efforts and imagination of trial counsel do not spare a defendant from a finding that its prior infringement was willful.

The second problem is the jury did not have to believe either Mei or Huang's testimony that they believed that DZEM's sensor did not infringe the '038 patent.

The third problem is that the jury heard evidence that DZEM had misled its customers about the risk of infringement of the '038 patent. DZEM was aware of the '038 patent by 2017. In 2018, DZEM commissioned freedom-to-operate opinions from two United States law firms. But DZEM did not inform those law firms of the '038 patent. The jury could infer from this failure to disclose that DZEM personnel intended to suppress information about potential infringement. But there's more. Shortly after filing this suit, SSI sent warning letters to DZEM

customers. Those customers turned to DZEM for explanation. DZEM expressed to its customers that it determined after an investigation that its sensor did not infringe the '038 patent. For example, Huang's email to DTNA said "[DZEM] is convinced that there [is] no evidence that our rubber cover infringes the complainant's patent. Our legal counsel has on multiple occasion[s] shared our analysis, position, and requested additional information from SSI." Trial Ex. 46. Huang included with his email an attachment that said:

To further confirm our patents' uniqueness [DZEM] requested in 2018 two USA law-firms to separately investigate and validate that we could obtain a Freedom to Operate (FTO).

During this study the patent attorneys performed a global search seeking any possible patent issues related to our urea sending unit, including the ultrasonic quality sensor.

It was found during the search that our sensor had "Freedom to Operate" meaning that the patent attorneys did not find any evidence of patent infringement.

*Id.* But Huang did not disclose to DTNA that the 2018 freedom-to-operate opinion did not actually consider the '038 patent, even though DZEM was aware of it when it commissioned the opinion. A reasonable jury could find that DZEM's response to its worried customers was dishonest, and that DZEM was aware of, or willfully blind to, the risk of infringement.

DZEM contends that Huang's email was intended only to communicate that DZEM had its own patents on its sensor. But that spin is not consistent with the text of the attachment to Huang's email. At the very least, a reasonable jury could infer that Huang's purpose in citing the 2018 freedom-to-operate opinion was to persuade DTNA that its non-infringement position was supported by the legal analysis of two United States law firms, but that was not true.

The fourth problem is that the jury heard circumstantial evidence of copying. DZEM gained access to SSI's technology through meetings over a potential joint venture, acquired an SSI sensor, and thereafter redesigned its sensor to include the rubber cover with a bubble-reduction filter. DZEM's rubber cover is not a literal copy of SSI's cover. But a reasonable jury could find that DZEM incorporated the filter and chimney arrangement from SSI's product. DZEM contends that it independently developed its rubber cover. It relied on a timeline in a presentation that showed that its sensor was developed in 2015. Ex. 52, page 16. But that presentation was prepared in 2019. DZEM provided essentially no contemporaneous documentation of the development of its cover in 2015, such as design drawings, change orders, or bills of material, or any of the types of documentation that a sophisticated company such as DZEM would be expected to have created in designing a product. The jury did not have to believe the testimony of DZEM's witnesses that it had developed the rubber cover before it saw SSI's sensor with one.

**b. Willfulness from May 23, 2024, to the date of the trial**

The jury found that DZEM's infringement was again willful after the court's second summary judgment opinion that concluded that DZEM's sensor infringed the '038 patent under the Federal Circuit's construction of "filter."

DZEM contends that its infringement was not willful after that date because the trial evidence showed that it began taking steps to convert its customers to sensors without the rubber cover. According to DZEM, it could not convert those customers to non-infringing sensors until the customers had "validated" the non-infringing sensors. And, although the validation process ordinarily takes a year or more, DZEM was doing what it could to expedite

the validation. So some infringement after May 23, 2024, was unavoidable, but DZEM did what it could to minimize it.

DZEM's post-trial argument isn't really that its infringement was non-willful. Rather, the argument is that its willful infringement should be excused. The jury heard evidence that DZEM knew its products had been found to infringe and continued infringement anyway. That's a sufficient evidentiary basis for a finding of willfulness. DZEM's purported justification might be a factor the court would consider in deciding whether to enhance damages.

PACCAR opted to switch to the sensor without the rubber cover to avoid potential for infringement. DZEM could have encouraged its other customers to do the same. DZEM could have encouraged its customers to validate its non-infringing sensor as soon as the Federal Circuit opinion issued, or at least as soon as the court issued its second summary judgment opinion. The jury heard DZEM's justification and wasn't persuaded that the infringement was non-willful. That, too, was a finding well supported by the evidence.

The court concludes that the jury's findings of willfulness in both periods are supported by the evidence.

## **2. PACCAR sales**

The verdict does not break out sales for individual customers, but it is apparent based on the damages amount that the jury awarded damages for DZEM sales to PACCAR. DZEM contends that the evidence at trial showed that DZEM sold to PACCAR only non-infringing sensors without the rubber cover. DZEM relies on the testimony of Robert Kirby, Ernie Huang, and Aaron Irvin, which DZEM contends stands un rebutted.

But that testimony was not as unequivocal as DZEM contends, and it was rebutted by other evidence. Kirby testified, by video deposition played for the jury, that DZEM had sold

23- or 24,000 “accused products” to PACCAR. Dkt. 325 (Kirby Dep., February 2, 2024) at 72:03–06, 73:19–74:04. DZEM now contends that the reference to “accused products” was intended to refer generally to the DZEM sensors at issue in the suit, and not as a concession that DZEM had sold sensors with the rubber cover to PACCAR. But that’s a stretch because the inquiry in Kirby’s February 2, 2024, deposition was to establish the number of sensors sold for purposes of determining damages. Sensors without a rubber cover were never at issue under the ’038 patent. A reasonable jury could discredit Kirby’s live trial testimony in light of what seemed to be a concession in his deposition.<sup>1</sup> The jury could discredit Huang and Irvin on the same basis.

DZEM’s own witnesses testified that DZEM had provided sensors with the rubber cover to PACCAR. For example, Irvin testified that PACCAR had first expressed interest in DZEM sensors in 2017 or early 2018. *See* Dkt. 334 (Transcript of Day 3, afternoon) at 96–105. At that time, DZEM was pitching sensors with the rubber cover to PACCAR. Once SSI notified PACCAR of the lawsuit, PACCAR asked for a back-up plan. DZEM offered either optical sensors or the ultrasonic sensor without the rubber cover, but DZEM discouraged PACCAR from making the change. PX 69. Ultimately, PACCAR decided to go with the coverless sensor, but that change required extensive validation before PACCAR would adopt it. The first units without the cover were sold to PACCAR only in late 2022.

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<sup>1</sup> DZEM’s reply cites deposition testimony from Kirby that the sensors sold to PACCAR didn’t have a rubber cover. Dkt. 381 at 10 (citing February 2, 2024 Kirby Dep. 12:8–13.). But Kirby’s testimony in the deposition was equivocal. He said that the product “we sell” to PACCAR doesn’t have a rubber cover. He couldn’t give the date of the transition to the coverless sensor. He also said “I’m sure they bought some units with the rubber cover.” Moreover, the testimony cited by DZEM was not presented to the jury, so it lends no support to DZEM’s motion. *See* Dkt. 325 (designated portions of the deposition).

DZEM contends that it corroborated its witnesses' testimony that all sales to PACCAR were coverless with physical and documentary evidence. DZEM cites a July 29, 2022, letter of intent that had part numbers corresponding to the coverless sensor. Dkt. 381, at 9. That letter was referred to in Irvin's testimony, but it wasn't introduced into evidence. DZEM introduced a physical specimen of the coverless sensor assembly, DX 642, but that's not probative because, as DZEM's witnesses testified, it was easy to simply remove the rubber cover.

Kirby testified that DZEM's claim that all sensors sold to PACCAR were coverless could be verified by PACCAR purchase orders. But DZEM did not produce any such purchase orders or any other verifying documentation. That was one of the reasons the court excluded DX 678, a late-produced spreadsheet purporting to show DZEM's sales of coverless sensors.<sup>2</sup>

Trial evidence showed that PACCAR purchases began with DZEM's standard TQS sensor with the rubber cover. At some point—it was late 2022 according to Irvin—PACCAR apparently switched to using non-infringing DZEM sensors without the rubber cover. But DZEM presented no evidence that would allow the jury to reliably quantify the sales of sensors without the cover. The jury was instructed (without objection from DZEM) that if the reason SSI has difficulty proving the amount of its lost profits was because DZEM did not maintain adequate records, it should resolve doubts in SSI's favor. The jury was entitled to do so here.

### **3. Lost profits**

DZEM asks the court to rule as a matter of law that SSI is not entitled to lost profits because SSI's expert disregarded evidence that DZEM's coverless sensor is an acceptable non-infringing substitute.

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<sup>2</sup> The excluded spreadsheet is DX 678; the allowed one is DX 677.



DZEM did not object to the jury instruction on the market share approach to proving lost profits, following the reasoning of *State Industries, Inc. v. Mor-Flo Industries, Inc.*, 883 F.2d 1573, 1578 (Fed. Cir. 1989). Under that approach, even if acceptable non-infringing substitutes are available in the market, the plaintiff is entitled to recover lost profits on defendant's infringing sales in proportion to plaintiff's share of the market.

In proving its share of the market, plaintiff must present "sound economic proof" of the state of the market with the infringement factored out. *Grain Processing Corp. v. Am. Maize-Prods. Co.*, 185 F.3d 1341, 1350 (Fed. Cir. 1999). A reconstruction of the so-called "but-for" market must also consider the potential actions of the infringer, if the infringer would have been a market participant with a non-infringing product. *Id.* DZEM's core argument is that SSI's damages expert, Richard Bero, failed to consider that DZEM had an available non-infringing substitute, namely its sensor sold without a rubber cover. DZEM contends that Bero's failure to accord some share of the but-for market to DZEM is a fatal flaw that requires the court to set aside the jury verdict awarding lost profits.

The court is not persuaded. Bero's reconstruction of the but-for market was one a reasonable jury could accept as based on sound economic proof. This is not a case in which the defendant was already in the DEF sensor market and would have remained an active participant with non-infringing products. Bero explained that DZEM had negligible sales of sensors before 2022. So the most relevant time frame was 2022 and 2023. Immediately before 2022, the United States market had just three participants: Shaw, WEMA, and SSI. SSI had about 75 percent of the pre-2022 market and Shaw and WEMA had a combined 25 percent. WEMA was leaving the market, and Shaw was losing a major customer to SSI. Bero testified

that 75 percent was a conservative estimate for SSI's market share immediately before infringement began.

DZEM entered the DEF sensor market significantly in 2022. But as Bero testified, all of DZEM's sales were to former customers of SSI, and all of those initial sales were of the infringing sensors. This suggests that DZEM would not have gained any significant market share, if not for its infringement. This inference is buttressed by DZEM's own reluctance to move to the coverless sensor, *see, e.g.*, PX 69, and the fact that many of DZEM's customers stuck with the infringing sensor with the cover even after SSI warned them about the potential infringement.

#### **4. New trial**

DZEM moves, in the alternative, for a new trial under Rule 59. Part of its motion recapitulates its arguments from its motion for judgment as a matter of law regarding SSI's expert's analysis of market share and his resulting opinions on lost profits. The court won't repeat the analysis of those issues. But DZEM also raises some new issues, based on evidentiary rulings by the court. Those are addressed in this section.

##### **a. Evidence related to sales to PACCAR**

DZEM contends that the court wrongfully excluded evidence that sales to PACCAR were of non-infringing sensors without the rubber cover.

The court excluded DX 676, which was a letter of intent between DZEM and PACCAR. DZEM says it was prejudiced by the exclusion because the document would show the part number for the coverless sensor to be sold to PACCAR. Both sides had this document on their original exhibit lists—plaintiff's version was PX 58. But both sides had removed the exhibit on their latest pretrial exhibit lists. The court excluded the exhibit because, in the week before

trial, neither side was on notice that the exhibit was still in the case. Dkt. 338, at 8. The court's ruling was justified, and the court is not persuaded that DZEM was prejudiced, because it put in other evidence of the part number of the coverless sensor, such as the example TQS sensor assembly, DX 642.

The court also excluded DX 678, a spreadsheet showing DZEM sensor sales by customer. This was an updated version of an earlier exhibit, DX 677, with an additional column that indicated whether the items sold were with or without the rubber cover. The updated spreadsheet was produced late, after SSI had conducted its last Rule 30(b)6 deposition of DZEM on damages. Moreover, despite discovery requests from SSI, DZEM had not produced the underlying documents that would have allowed SSI to verify the information in the additional column. DZEM argued that DX 678 was a Rule 1006 summary. The court rejected that argument because DZEM had not followed the verification process required by Rule 1006. DZEM argued that it was admissible as a business record because it was drawn from its enterprise resource system that it used to run its business. But the DX 678 spreadsheet itself was not a business record made and kept in the regular course of its business; DX 678 was an exhibit that had been created for the purposes of the litigation to support DZEM's contention that it sold a lot of sensors without the rubber cover. The exclusion of DX 678 was proper.

**b. Customer evidence unfavorable to SSI**

DZEM sought to introduce evidence that SSI's sensors were unreliable. The court excluded some of this evidence, which DZEM contends warrants a new trial. The court is not persuaded that it excluded any admissible evidence.

DZEM sought to introduce correspondence from former SSI customers to DZEM complaining about quality problems with SSI sensors. DZEM wanted to introduce that

evidence to show that SSI customers switched to DZEM because the SSI sensors were defective, not because they wanted the infringing product. The point would have been relevant to damages. But the court excluded statements by DZEM's customers as hearsay.

DZEM argues that it would have used the customers' out-of-court statements not for the truth of those statements, but to show why SSI customers switched to DZEM. The court is not persuaded. DZEM would not be introducing the customer statements to show the impact of those statements on the recipient. That's arguably a non-hearsay purpose. Rather, DZEM intended to introduce the customer statements for their truth: to show that the customers believed the SSI sensors to be defective. That's not a non-hearsay use. And the truth of the underlying assertion about the SSI sensors is implicit in the customer statements.

DZEM contends that the court allowed SSI to introduce hearsay statements from its customers. Dkt. 358, at 25. But DZEM cites only a single example—testimony by Gregory Muphy, SSI's technical director, about the development of SSI's sensor. The objected-to question was whether SSI had received feedback from its customers. DZEM objected on hearsay grounds. But whether SSI had received feedback was not hearsay. DZEM did not object to the answer, which contained arguable hearsay. Dkt. 332 (Transcript of Day 2, afternoon) at 12. In any case, that was harmless: the witness was explaining the need for bubble-reduction, which could have been (and was, repeatedly) explained without reference to customer feedback.

DZEM objects to the court's exclusion of statements from DZEM employees about technical problems with SSI sensors. Those were properly excluded as undisclosed expert testimony.

The bottom line is that customer dissatisfaction with SSI would have been relevant to SSI's damages case. DZEM could have presented this information in an admissible form with witnesses from those customers, who would have been allowed to testify on the basis of their own knowledge and subjected to cross-examination by SSI. The evidence that DZEM actually adduced at trial was not admissible; the court properly excluded it.

**c. Limits on Fisher testimony**

DZEM contends that the court improperly limited the testimony of its damages expert, Lindsey Fisher, about the parties' market shares. Dkt. 358 at 26–29. The court granted a pretrial motion in limine that precluded Fisher from testifying about market share. Dkt. 291, at 4. The court stands by its reasoning. Fisher based her market share opinions on discussions with DZEM personnel. But Kirby, testifying as DZEM's Rule 30(b)(6) witness on the topic, had testified that he could offer no more than a rough estimate of DZEM's market share. That closed off SSI's inquiry on the subject, and it would have been unfair for Fisher to provide a different opinion based on DZEM knowledge that had been conveyed to her but not provided to SSI.

DZEM contends that SSI opened the door by questioning Fisher about her opinions on market share. Dkt. 358, at 28–29. The court is not persuaded. After a sidebar discussion with the court, SSI's counsel limited his questions to avoid direct confrontation with Fisher about her excluded market share opinions. But that did not mean that SSI was unable to point out that DZEM had not presented evidence to contradict SSI's evidence about market share.

**d. Bero's reasonable royalty analysis**

DZEM contends that a new trial is warranted because the court prevented DZEM from presenting evidence concerning the apportionment of value to the '038 patent while allowing

SSI's damage expert free reign to present a flawed royalty theory in which he attributed all the value of the parties' sensors to the '038 patent.

One critical component of DZEM's argument concerns another SSI patent, United States Patent No. 8,733,153. The court limited evidence about the '153 patent because it was no longer directly at issue after the court's first summary judgment opinion and evidence about the '153 patent would risk juror confusion. But the court allowed DZEM to cross examine Bero with his prior opinions in which he ascribed part of the value of SSI's technology to the '153 patent. DZEM characterizes the court's ruling as allowing only "an extremely limited cross-examination." Dkt. 358 at 30. But other than saying that the examination on the '153 patent should be brief, the court allowed DZEM to confront Bero with any other patented technology in the SSI sensor that contributed to its value. Dkt. 338 (Transcript of Day 2, morning) at 24–25.

The other component of DZEM's argument concerns that court's limiting the testimony of DZEM's damages expert, Lindsey Fisher. The court stands by its rulings, which are Dkt. 291 at 1–5. However, those rulings did not prevent Fisher from presenting her own opinions about apportionment. The court ruled that "Fisher is free to testify that the portion of profits attributable to SSI's patented technology should be reduced to account for other features of the accused products, including technological innovation by DZEM." Dkt. 291 at 5. On this point, the court simply barred Fisher from discussing DZEM's own patents, because the infringer's own patents are likely to lead to juror confusion.

The bottom line is that DZEM had a fair opportunity to impeach Bero's reasonable royalty analysis, and a new trial is not warranted on that basis.

**e. Inflammatory statements**

DZEM contends that a new trial is warranted because the court allowed SSI to make irrelevant and highly prejudicial statements to the jury over DZEM's objections. The purportedly prejudicial statement concern three topics.

First, SSI presented evidence and argument that DZEM's infringement resulted in employee layoffs. SSI made a brief reference to the layoffs in its opening statement, and its corporate representative had brief testimony about it. Contrary to DZEM's suggestion, there was no reference to layoffs in SSI's closing argument. In closing, SSI referred only to its pre-infringement employment level to show that it had the capacity to make additional sales. The statement in closing was relevant to the lost-profits argument.

The mention of the layoffs in the opening statement and the brief testimony about it were minor points, and not stressed or emphasized by SSI. The jury would likely have inferred some impact on SSI employment based on the other evidence presented, specifically that some of SSI's largest customers switched to DZEM. The limited evidence of layoffs does not warrant a new trial.

Second, SSI referred to some of DZEM's witnesses coming from China to testify, which DZEM says was prejudicial. The court had ruled that the parties were not to make arguments unduly emphasizing the nationalities of the parties. As SSI points out, both sides elicited testimony about where the various witnesses worked. References to China and other countries in this case were inevitable. SSI did not make any inflammatory or unfair references to the nationality of DZEM's witnesses or DZEM itself.

Third, DZEM complains that the court allowed SSI to make prejudicial references to DZEM's copying of SSI's product. Copying was a contested issue in the case. SSI was entitled

to try to show that DZEM copied its product, even if DZEM's product was not a direct, literal copy.

A new trial is not warranted based on alleged prejudicial statements by SSI.

**f. Remittitur**

Alternatively, DZEM ask for remittitur. On a request for remittitur, the essential inquiry is whether the jury's award of damages is rationally related to the evidence. *Gracia v. SigmaTron Int'l*, 842 F.3d 1010, 1022 (7th Cir. 2016). DZEM contends that it was not, citing the reasons it gives in its motion for judgment as a matter of law. The court is not persuaded. The jury found Bero's analysis convincing, and that analysis was well supported by evidence.

**B. SSI's post-trial motions**

SSI filed an omnibus motion asking for several items of relief:

- supplemental damages;
- enhanced damages;
- a finding that the case is exceptional, with an award of attorney fees;
- reimbursement of litigation expenses that are not taxable as costs; and
- prejudgment interest.

The court considers each of these requests in the sections that follow.

**1. Supplemental damages**

SSI asks for supplemental damages for infringing sales after July 31, 2024, which was the end of the period considered by the experts. DZEM does not oppose the motion, although it contends that many of its post-trial sales are of non-infringing products.



The court will grant the motion and order DZEM to provide supplemental documentation of its sales after July 31, 2024. The court will award damages on infringing sales according to the formula used by Bero, which the jury adopted. The court will award lost profits on 75 percent of the units sold at the rate of \$40 per unit; the court will award royalties of \$20 per unit on the remaining 25 percent of units sold.

The court will not award supplemental damages on any non-infringing sales (including those to PACCAR). But the court will require DZEM to provide robust verifying documentation of any sensor units that it contends are non-infringing. The court will assume that any optical DEF sensor sale is infringing if documentation for the sale is lacking or ambiguous.

In the order below, the court sets a deadline for DZEM to provide documentation of its post-July 31, 2024, sales. The parties are encouraged to reach a stipulation on the quantity of infringing sales. In the absence of agreement, deadlines are provided for SSI's request for supplemental damages and for DZEM's response.

## **2. Enhanced damages**

SSI moves for enhanced damages under 35 U.S.C. § 284. Under *Halo*, SSI bears the burden to show its entitlement to enhanced damages by a preponderance of the evidence. 579 U.S. at 107. Whether to award enhanced damages is within the discretion of the court, but it is reserved for “egregious cases of culpable behavior.” *Id.* at 104. The analysis is not constrained by any rigid formula. *Id.* at 107.

The court begins with two preliminary observations. First, the jury found that DZEM's infringement was willful during two periods. Although the court is not compelled to enhance damages on the basis of this finding, the jury's determination provides strong support for

enhanced damages for those periods. Second, DZEM relies heavily on post-trial declarations to oppose SSI's motion. This is confusing at best. If DZEM had evidence that its conduct was not egregious, it should have been presented at trial when its declarants would have been subject to cross-examination. The court will focus on the evidence presented at trial.

Although there is no rigid formula for enhancing damages, *Read Corp. v. Portec, Inc.*, 970 F.2d 816 (Fed. Cir. 1992), provides a useful set of factors to consider even after *Halo. Stryker Corp. v. Zimmer, Inc.*, No. 1:10-CV-1223, 2017 WL 4286412, at \*3 (W.D. Mich. July 12, 2017), *aff'd*, 745 F. App'x 167 (Fed. Cir. 2018).

The first *Read* factor is whether the defendant copied the plaintiff's ideas or designs. As explained above, there was no evidence of literal copying of SSI's DEF sensor or its rubber cover, such as by using SSI's cover to make a mold. But there is strong circumstantial evidence that DZEM copied the concept of using a rubber cover with a filter and chimney as a bubble-reduction device after it toured SSI's plant, unilaterally terminated discussions of a potential joint venture, and acquired one of the SSI sensors.

DZEM's main counterargument to the copying allegation relies on its own patent application. Dkt. 372, at 22. DZEM applied for a patent on an "Optical Concentration Sensor Protective Casing and Optical Concentration Testing Device" on February 26, 2016. *See* Dkt. 370-1 (Application No. PCT/CN2016/074697) and Dkt. 370-4 (English translation). The patent issued in the United States as U.S. Patent No. 10,670,516. Dkt. 370-8. DZEM argues that this refutes the copying allegation because the patent application says "[t]he bubble isolation shield may be made of rubber" Dkt. 370-4 at 5, thus demonstrating that DZEM had the idea of a rubber cover before it was aware of SSI's technology.

DZEM's counterargument is feeble. The bubble isolation shield in the DZEM patent may be made of rubber, but it does not have a filter. DZEM's 2016 bubble isolation system used baffles in a separate chamber to direct bubbles away from the opening to the sensing area. The 2016 device looks nothing like the rubber cover actually used in DZEM's sensors and it operates in a different way. *See* Dkt. 80, ¶¶ 78–82 (Strzelec expert report). DZEM's 2016 patent application does not meaningfully refute the allegation of copying.

The second *Read* factor is whether the infringer had a good-faith belief in non-infringement or invalidity. The jury found DZEM's original infringement to be willful, and the court has already concluded that that finding is supported by the evidence. DZEM personnel did not actually consider the non-infringement and invalidity opinions that DZEM acquired from outside counsel. Indeed, DZEM's opinion counsel found that the critical filter element (with all the other claim elements) was literally present in the DZEM sensor. Dkt. 371-1 at 14. His non-infringement position was based on a poorly supported opinion that the filter was claimed in means-plus-function form and thus limited to the mesh filters disclosed in the patent. *Id.* at 15–16. DZEM did not press that non-infringement argument in this case. DZEM attempted to use its deficient freedom-to-operate opinions to quell concern among its customers that DZEM's sensors infringed SSI's '038 patent. The evidence suggests that the opinions of counsel were merely a fig leaf for DZEM's disregard of SSI's patent rights. This court originally found persuasive the arguments by DZEM's trial counsel about the filter element, which shows that the infringement question was reasonably debatable. But this court's determination counts for little in light of the jury finding and the evidence that before trial, DZEM had cavalierly disregarded SSI's patent rights. The court sees no good-faith basis for

DZEM's infringement after May 23, 2024. At that point, DZEM made a calculated decision that continued infringement was simply necessary for business purposes.

The third *Read* factor concerns the defendant's conduct as a party to the litigation. DZEM demonstrated a pattern of dilatory discovery responses in this litigation, culminating with the oversized document production in February 2024, which comprised 85 percent of DZEM's total document production. DZEM suffered some consequences for this pattern during the trial: the court awarded SSI some of its fees in bringing discovery motions, and the jury apparently held DZEM's failure to produce documentation of the PACCAR sales against DZEM. But it was a consistent theme that weighs in favor of enhancing damages.

The fourth *Read* factor concerns DZEM's size and financial condition. DZEM is a large company with substantial financial resources. The jury verdict is a small one in light of DZEM's \$300 million annual revenue, and even in light of DZEM's \$70 million revenue on infringing sales. This factor would not provide additional justification for enhanced damages. But DZEM makes no argument that its size and financial condition would militate against such an award.

The fifth *Read* factor concerns the closeness of the case. This factor favors DZEM. Patent cases often come down to a single critical claim construction issue. This one turned primarily on the meaning of "filter." The court's first summary judgment decision shows that DZEM had a reasonable non-infringement position during the first phase of this litigation, until the court of appeals' decision. (DZEM's invalidity case, however, did not present close calls and was meagerly supported by expert opinion. Nor are DZEM's alternative non-infringement arguments strong ones.)

The sixth and seventh *Read* factors concern the duration of the defendant's infringement and any remedial action taken by defendant. These are aggravating factors here because DZEM

continued its infringement even after it should have realized that its primary non-infringement argument had been rejected by the court of appeals. It has only slowly undertaken remedial action even after the court's second summary judgment decision.

The eighth *Read* factor concerns the infringer's motivation to harm. The evidence at trial included testimony from Robert Kirby that DZEM was concerned less with profitability and primarily with developing market share, which it did primarily at the expense of SSI. SSI had approximately 75 percent of the market when infringement began, and DZEM built its United States market share primarily with SSI's former customers. This supports the conclusion that DZEM intended to harm SSI, and therefore this factor supports the enhancement of damages.

The ninth *Read* factor concerns whether the infringer attempted to conceal its misconduct. Although DZEM was unable to conceal its infringement from SSI, DZEM's misleading use of the freedom-to-operate opinions was calculated to conceal its infringement from its customers.

The consideration of the *Read* factors, in light of the jury's verdict, warrants enhanced damages. The reasonableness of DZEM's infringement defense in this court, the one factor that tips to DZEM, does not preclude an award of enhanced damages. *Halo*, 579 U.S. at 104. The three factors that the court considers most aggravating are (1) DZEM's misleading use of the freedom-to-operate opinion; (2) its dilatory discovery responses; and (3) its failure to promptly discontinue infringing sales after decisions by the court of appeals and this court. On balance, the evidence at trial demonstrates egregious infringement behavior that warrants enhanced damages.

The next question is how much to enhance the damages. The damages awarded at trial, about \$16.6 million, would have virtually no deterrent effect against DZEM's revenue of \$70 million from sales of infringing sensors. Trebling the damages from the two periods during which the jury found willful infringement is plainly warranted. The court will also treble the damages awarded for sales after July 31, 2024, which will be determined on the basis of supplemental discovery to be provided by DZEM.

Whether to enhance the damages during the interim period—when there was no jury finding of willfulness—is a closer question. But the court concludes that enhancement is warranted because DZEM gained market share on the basis of its original infringing sales and offers of sale. During the initial period of willful infringement, DZEM offered for sale and entered into agreements to sell infringing sensors to many customers, including PACCAR, Cummins, Caterpillar, DTNA, Unipac, and Pierce. Dkt. 339 (Transcript of Day 3, morning) 65:23–66:19; Dkt. 334 (Transcript of Day 3, afternoon) 81:6–18; DX 674. The evidence at trial strongly supports the inference that if not for the original willful infringement, DZEM would not have so readily captured such a substantial proportion of SSI's market share. Because the infringement in this period was not directly willful, the court will double, rather than treble, the damages for that period.

The damages for infringing products sold by DZEM from January 2019 to September 3, 2021, were \$26,700. The damages for May 23, 2024, to July 31, 2024, were \$2,055,960, based on the methodology used by the jury. The damages for the interim period were \$14,444,700. Thus, the total damages as enhanced are \$35,359,380 (not including supplemental damages for infringing sales after July 31, 2024).

### 3. Exceptional case; attorney fees

SSI asks the court to deem the case exceptional and award SSI its attorney fees under 35 U.S.C. § 285. SSI bears the burden to show that the case is exceptional by a preponderance of the evidence. *Octane Fitness, LLC v. ICON Health & Fitness, Inc.*, 572 U.S. 545, 557 (2014). As with the enhanced damages inquiry, there is no precise formula for determining whether a case is exceptional. *Id.* at 553–54. The matter is committed to the discretion of the district court.

According to SSI, the same considerations that support the enhancement of damages, also support the award of attorney fees: the jury finding of willfulness; the circumstantial evidence of copying; and DZEM’s litigation conduct, particularly its discovery deficiencies. DZEM mounts the same defense, contending that this was just a typical, hard-fought patent dispute, which each side tallying wins and losses along the way.

DZEM is right that aspects of this case are typical of patent litigation. SSI asserted two patents, and DZEM responded with the usual counterclaims for declarations of non-infringement and invalidity of both patents, plus a counterclaim for tortious interference. There was extensive motion practice, on substantive issues as well as discovery disputes. All this is typical in patent litigation. The court granted summary judgment of non-infringement to DZEM and summary judgment to SSI on the tortious interference claim. The Federal Circuit affirmed the summary judgment to SSI on the tortious interference counterclaim and the summary judgment of non-infringement on one of the patents. But it reversed a key claim construction, vacated the summary judgment on the ’038 patent, and remanded the case. These developments, too, are not at all unusual in patent cases.

But after the remand, SSI prevailed on every major decision. As this court held, under the Federal Circuit's claim construction, DZEM's infringement was clear as a matter of law. The court granted summary judgment to SSI, concluding that DZEM's invalidity challenge was weak. The jury awarded almost exactly what SSI's expert requested in damages, and found that DZEM's infringement was willful, except for the period between the court's two summary judgment decisions.

The post-remand developments, particularly the finding of willfulness, make the case extraordinary. The court also considers the circumstantial evidence of copying by DZEM, the misleading use of the freedom-to-operate opinions, and DZEM's discovery deficiencies as additional factors supporting the court's finding that the case is an extraordinary one. SSI is clearly the prevailing party. But it would not be equitable to shift the entire cost of this litigation to DZEM, when so much of it was conducted like a typical patent case.

The court will award SSI its reasonable attorney fees incurred after the Federal Court issued the mandate on February 13, 2023. That includes the time SSI had to contend with DZEM's dilatory and contradictory responses to the supplemental discovery on damages, as well as trial preparation and the trial itself. The court recognizes that the jury's finding of willfulness was based on some conduct by DZEM that occurred before February 13, 2023, and that SSI had to respond to DZEM's invalidity case on the '038 patent before that date. But using that date as starting point for fee-shifting recognizes the closeness of the early parts of the case, and it provides a rough approximation of the extent to which this case was extraordinary and the portions for which it would be fair to require DZEM to compensate SSI.



#### **4. Non-taxable costs**

SSI asks the court to allow it to recover certain litigation expenses that are not taxable as costs. Section 285 authorizes such an award. *Lam, Inc. v. Johns-Manville Corp.*, 718 F.2d 1056, 1069 (Fed. Cir. 1983). The court finds that expenses cited in SSI's motion, Dkt. 356 at 38–42, are typical of patent cases of this scale and were necessarily obtained for the case. The court will award those expenses incurred after February 13, 2023.

In Section D below, the court denies SSI's request to tax some of its e-discovery expenses as costs under 28 U.S.C. § 1920. But the court will allow SSI to recover its e-discovery expenses incurred after February 13, 2023, under § 285, regardless of whether they are taxable under § 1920.

#### **5. Prejudgment interest**

The parties agree that SSI is entitled to prejudgment interest at the prime rate. The court will follow its more recent practice and provide for quarterly compounding. Prejudgment interest will be awarded on post-trial damages, but not on enhanced damages or attorney fees. *Lam, Inc.*, 718 F.2d at 1066.

#### **C. SSI Motion for injunction**

SSI moves for a permanent injunction enjoining DZEM from sales of infringing sensors. The court may issue an injunction if SSI makes the required four-part showing under *eBay Inc. v. MercExchange, LLC*, 547 U.S. 388, 391 (2006). There is no presumption that the prevailing patent owner will suffer irreparable harm, or that it is entitled to injunctive relief. But the fundamental nature of a patent is that it grants the owner the right to exclude. The right to exclude is not by itself sufficient to warrant an injunction against future infringement, but it's

not a factor to be ignored. *Robert Bosch LLC v. Pylon Mfg. Corp.*, 659 F.3d 1142, 1149 (Fed. Cir. 2011).

The court starts with the general context. SSI and DZEM are the two leading providers of DEF sensors in the United States market, so they are head-to-head competitors for the same few customers in the diesel engine and vehicle markets. SSI has not licensed the '038 patent; it makes its money from selling products, not from license fees. Contamination by air bubbles is a serious and well-known problem for ultrasonic DEF sensors, and the filter and chimney arrangement claimed in the '038 patent remediates the bubble problem. SSI's own product practices the invention claimed in the '038 patent, as the court held at summary judgment. Dkt. 239 at 15. In that basic scenario, a prevailing patent owner will generally be able to make the required *eBay* showing.

The court turns to the *eBay* factors and DZEM's counterarguments.

### **1. Irreparable harm**

SSI showed at trial that it lost significant market share to DZEM in a short time after DZEM began infringement. The loss of market share to an infringer when the patented feature is a basis for demand is irreparable harm. *TEK Glob., S.R.L. v. Sealant Sys. Int'l, Inc.*, 920 F.3d 777, 792 (Fed. Cir. 2019). Although DZEM sold the sensor only as a part of a larger assembly, evidence at trial showed that DZEM's prices were lower than SSI's. This supports the inference that SSI's loss of market share would be accompanied by price erosion, another irreparable harm.

DZEM contends that SSI lost customers to DZEM not because of the patented feature, but because of quality problems, specifically corrosion caused by ammonia penetrating the sensor. But that's not supported by the admissible evidence. The court excluded hearsay

statements from SSI customers. The trial evidence was that SSI sensors initially had a return rate for ammonia penetration of 0.12 percent, whereas DZEM had a return rate of 0.08 percent. There was no evidence admitted at trial to show that any SSI customers switched to DZEM based on that difference.

DZEM also contests SSI's claim that DZEM's prices were lower than SSI. DZEM cites Bero's trial testimony that SSI's sensor's average sale price was \$88, whereas DZEM's sensor assembly sold for \$142. Dkt. 350 (citing Dkt. 333 at 28:16–29:13). DZEM's argument is disingenuous. It's not meaningful to compare the price of the full assembly sold by DZEM to the price of the sensor unit sold by SSI. Kirby testified that DZEM's prices are generally lower than SSI's. Dkt. 325 at 145:12–14.

SSI has shown that it has and will continue to suffer irreparable harm without an injunction.

## **2. SSI's legal remedies are not adequate**

Money damages would adequately compensate SSI for each infringing sale, and there's no suggestion that DZEM would be unable to satisfy any monetary judgment. But the loss of market share, with the resulting price erosion, loss of goodwill, and diminished customer relationships, will lead to further injury that would be impossible to calculate. Money damages could not compensate SSI for its likely losses than cannot be calculated.

SSI's legal remedies are inadequate.

## **3. Balance of hardships favor the injunction**

The harm to SSI from DZEM's past infringement is clear; future harm without an injunction is inevitable. DZEM argues only that an immediate injunction would harm it and its customers because they need time to validate DZEM's non-infringing sensor without a

cover. But DZEM represented that its customers would be able to move to the non-infringing sensors by February 28, 2025, without interruption of their business.

The balance of harms favors SSI.

#### **4. The public interest would not be impaired**

The court must consider whether the public interest would be disserved by the injunction. The only public interest consideration cited by DZEM concerns the ability of its customers to validate its non-infringing sensor. Because that process should be complete by now, the court concludes that the public interest would not be disserved by the injunction.

SSI has made the required showing. The court will grant the motion and enjoin DZEM from further infringement effective immediately.

#### **D. Bill of costs**

SSI has submitted a bill of taxable costs under 28 U.S.C. § 1920. Dkt. 353. SSI's supporting documentation is attached to the declarations of Shane Brunner, Dkt. 354, and Tammy Romack, Dkt. 355. DZEM objects to three categories of SSI's requested costs, and it requests that the court forestall taxation of costs until it has exhausted its right to appeal.

##### **1. E-discovery costs**

E-discovery costs are not a category of costs generally recoverable under § 1920. But certain e-discovery costs are recoverable, specifically those that are the equivalent of making copies necessary for the litigation. *Split Pivot, Inc. v. Trek Bicycle Corp.*, 154 F. Supp. 3d 769, 778 (W.D. Wis. 2015) (citing *Race Tires America, Inc. v. Hoosier Racing Tire Corp.*, 674 F.3d 158 (3d Cir. 2012)). Hosting fees, user fees, and consulting fees are not recoverable. SSI contends that it has excluded those types of fees from its bill of costs. Its e-discovery charges and

deductions are shown on a spreadsheet, followed by the invoices from Legility, the discovery services provider. Dkt. 355-1.

DZEM contends that SSI has not eliminated all the non-recoverable e-discovery costs. DZEM objects to charges for certain items, labelled on the invoices as “Native File Processing/GB,” “Review Solutions/Technical Time,” and “Project Consulting/Hour” to cite three examples. Dkt. 361 at 3. In response, SSI submitted a declaration from Melissa Pingel, litigation support and discovery project manager at counsel’s law firm, purporting to describe the objected-to categories. Dkt. 366. Many of the item descriptions on the Legility invoices are truly opaque, most notably the many charges for “project consulting.” Some of the descriptions are more detailed, such as:

2-Step Inverito Phase I - Data Extraction, Culling & ECA: Deduplication, file type inclusion/exclusion, date cull and de-NISTing. Processing of culled data (extraction of metadata & text) and load into inVerito for unlimited client keyword, domain filtering, searching and viewing of data / GB

Dkt. 355-1 at 16. This description does not sound like the limited processing that is the equivalent of making copies, Bates stamping, and delivery. The Pingel declaration is conclusory, and the court is not persuaded that it adequately explains how the objected-to charges are the equivalent of making copies necessary for litigation.

Some of SSI’s e-discovery costs would have been recoverable as the equivalent of copy costs, but SSI’s documentation fails to segregate the recoverable costs. Accordingly, the court will not tax as costs any of SSI’s e-discovery expenses. (As indicated above, discovery costs incurred after February 13, 2023, are recoverable under § 285.)

## 2. Exemplification and copy costs

SSI submits documentation of \$25,180.67 in exemplification and copy costs. DZEM acknowledges that exemplification and copy costs are recoverable to the extent that they were “necessarily obtained for use in the case.” 28 U.S.C. § 1920(4). DZEM contends that SSI’s copies were not necessary, but merely for the convenience of counsel and thus not recoverable.

SSI’s counsel submitted a declaration attesting that the copies were for trial exhibits. Dkt. 367. The bulk of the copy costs—\$21,374.64—were charged on a single invoice dated September 3, 2024. Dkt. 354-4 at 5. The first day of trial was September 30, 2024. The other copies, though not made close to trial, are a modest amount that were plausibly necessary for litigation tasks. The court is persuaded that SSI has adequately shown that its requested copy charges were for documents necessarily obtained for the case.

## 3. Deposition expenses

DZEM objects to certain deposition-related costs, specifically the costs of copies of deposition exhibits, costs of condensed and rough transcripts, and shipping costs. This was a long-running complex patent case. The practice of paying for rough daily transcripts during trial is commonplace in litigation of this scale. The court requires the filing of each deposition transcript in condensed form. The copying of deposition exhibits is not a mere convenience for counsel, like an extra sets of exhibits for multiple attorneys in the same firm. The copies of deposition exhibits to be included with the transcript ensures that it is clear what exhibits are referred to in depositions. (The copying of deposition exhibits would be recoverable as necessary copies if not as a deposition expense.) The court of appeals has approved the award of costs incidental to depositions, such as shipping expenses. *Finchum v. Ford Motor Co.*, 57 F.3d

526, 534 (7th Cir. 1995). Following the principles in *Split Pivot*, the court concludes that in a case of this complexity, SSI's deposition expenses are taxable as costs.

#### **4. Timing of taxation**

The court is not persuaded that there is any good reason to forestall the taxation of costs. Accordingly, costs will be taxed in the amount of \$95,160.09.

### **ORDER**

IT IS ORDERED that:

1. Defendant Dongguan Zhengyang Electronic Mechanical LTD's motion for judgment as a matter of law or for a new trial, Dkt. 347, is DENIED.
2. Plaintiff SSI Technologies, LLC's post-trial motions, Dkt. 356, are GRANTED as follows:
  - a. DZEM is ordered to provide SSI a complete accounting of sales of infringing products after July 31, 2024, by May 5, 2025.
  - b. The court will award supplemental damages for all infringing sales after July 31, 2024, at the rates of \$40 per unit for 75 percent of the units sold and \$20 per unit for the remaining 25 percent of the units.
  - c. The court will enhance damages as provided in the opinion above.
  - d. The court deems the case exceptional as of February 13, 2023, and the court awards SSI its reasonable actual attorney fees and litigation expenses after that date.
  - e. SSI is ordered to submit its supplemental request for damages and its motion for attorney fees to the court by May 19, 2025. DZEM may have until June 2, 2025, to respond; SSI have until June 12, 2025, to reply.
  - f. The court awards prejudgment interest on the damages found by the jury and the supplemental damages at the rate of 7.5 percent (the prime rate as of April 1, 2024) to be compounded quarterly.
3. SSI's renewed motion for a permanent injunction, Dkt. 336, is GRANTED. The court will issue a separate order for injunction.

4. Costs will be taxed as requested in SSI's bill of costs, Dkt. 353, with the exception of the e-discovery costs. Accordingly, costs are taxed in the amount of \$95,160.09.
5. DZEM's motion for a hearing and oral argument, Dkt. 382, is DENIED.
6. SSI's motion requesting redactions, Dkt. 345, is GRANTED.
7. SSI's motion for leave to file a sur-reply, Dkt. 386, is GRANTED.

Entered April 21, 2025.

BY THE COURT:

/s/

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JAMES D. PETERSON  
District Judge